

LISTING OF CLAIMS

1. (Currently Amended) An electronic component, comprising:

an integrated circuit embodied on a single monolithic substrate and incorporating:

a tuning circuit module of the direct sampling type including mixed analog and digital circuitry configured to receive RF satellite digital television analog signals composed of several channels at a circuit input for direct sampling at RF and digital transposition to output several downconverted signals each associated with a different selected channel; and

several channel decoding digital circuits modules connected at the outputs an output of the tuning circuit module and each including digital circuitry to deliver respectively and simultaneously several streams of data packets corresponding to the several different selected channels;

wherein analog and digital circuitry of both the tuning circuit module and the several channel decoding circuits modules are fabricated on that single monolithic substrate.

2. (Currently Amended) The component according to Claim 1, wherein the channels extend over a predetermined frequency span and the RF analog signals convey digital information coded by digital modulation, and

wherein the tuning circuit module comprises:

an analog stage receiving the RF said analog signals;

a multibit analog/digital conversion stage having a sampling frequency equal to at least twice the frequency span of the sampled RF signal; and

several digital devices for transposing frequencies that are connected to the output of the analog conversion stage, each digital device being configured to separately deliver a sampled digital signal centered at the zero frequency and corresponding to the [a] selected channel.

3. (Currently Amended) The component according to Claim 1, wherein the channels extend over a predetermined frequency span and the RF analog signals convey digital information coded by digital modulation, and

wherein each channel decoding digital circuit module comprises:

a digital decimator filter followed by an additional digital filter for eliminating information of adjacent channels; and

a digital error correction stage for delivering a stream of data packets corresponding to the information conveyed by the channel being processed by the channel decoding module.

4. (Currently Amended) The component according to Claim 1, wherein the channels extend over a predetermined frequency span and the RF analog signals convey digital information coded by digital modulation, and

wherein the tuning circuit module comprises:

an analog stage receiving the RF ~~said analog~~ signals;

a multibit analog/digital conversion stage having a sampling frequency equal to at least twice the frequency span of the sampled RF signals; and

several digital devices for transposing frequencies that are connected to the output of the analog conversion stage, each digital device ~~being~~ configured to separately deliver a sampled digital signal centered at the zero frequency and corresponding to the ~~[[a]]~~ selected channel; and

wherein each channel decoding digital circuit module comprises:

a digital decimator filter followed by an additional digital filter for eliminating information of adjacent channels; and

a digital error correction stage for delivering a stream of data packets corresponding to the information conveyed by the channel associated with the sampled digital signal processed by this channel decoding circuit module.

5. (Original) The component according to Claim 4, wherein the resolution of the analog/digital conversion stage is greater than or equal to 6 bits.

6. (Original) The component according to Claim 4, wherein the decimator filter is a low-pass filter whose cutoff frequency is of the order of twice the frequency half-width of a channel, and wherein the cutoff frequency of the additional digital filter is of the order of the frequency half-width of a channel.

7. (Previously Presented) The component according to Claim 1, further comprising a grounding metal plate glued to a rear face of the single monolithic substrate by a conducting glue.

8. (Currently Amended) The component according to Claim 1, wherein the substrate has a first type of conductivity and circuitry of the tuning circuit module and several channel decoding digital circuits modules performing a digital processing are disposed in a part of the substrate that is insulated from the remaining part of the substrate providing analog circuitry of the tuning circuit module by a semiconducting barrier having a second type of conductivity different from the first type of conductivity, and wherein the semiconducting barrier is biased by a bias voltage different from that used for the insulated part of the substrate.

9. (Original) The component of Claim 1, wherein the electronic component comprises a satellite digital television signal receiver.

10. (Currently Amended) An integrated circuit, comprising:
- a single monolithic substrate in which the following circuit components are provided:
- an input receiving an RF analog signal including a plurality of channels;
- an analog-to-digital converter to sample and convert the RF analog signal to a digital signal;
- a first digital tuner that downconverts the digital signal to a first downconverted digital signal, wherein information of a selected first channel in the downconverted digital signal is centered at zero frequency;
- a first channel decoding digital circuit module connected to the first digital tuner that digitally decodes the first downconverted digital signal to output a stream of data packets for the selected first channel;
- a second digital tuner that downconverts the digital signal to a second downconverted digital signal, wherein information of a selected second channel in the downconverted digital signal is centered at zero frequency; and
- a second channel decoding digital circuit module connected to the second digital tuner that digitally decodes the second downconverted digital signal to output a stream of data packets for the selected second channel;
- wherein circuitry of the converter, tuners and channel decoding digital circuits modules are fabricated on that single monolithic substrate.

11. (Currently Amended) The circuit of claim 10 wherein the first and second digital tuners perform are each of a direct sampling type which performs frequency transposition and channel selection in a digital domain.

12. (Currently Amended) The circuit of claim 10 wherein the analog-to-digital converter oversamples the received RF analog signal.

13. (Currently Amended) The circuit of claim 10 wherein the RF analog signal conveys information for the plurality of channels by digital modulation.

14. (Currently Amended) The circuit of claim 10 wherein the channels of the RF analog signal extend over a frequency span and wherein the analog-to-digital converter oversamples the received RF analog signal at a sampling frequency at least twice the frequency span.

15. (Currently Amended) The circuit of claim 14 wherein the RF analog signal comprises a satellite digital television analog signal.

16. (Currently Amended) The circuit of claim 10 wherein each of the decoding digital circuits modules comprises:

a decimator filter that filters the downconverted digital signal to output digital signals relating to the selected channel and adjacent channel information;

a digital filter that filters out the adjacent channel information; and

an error correction stage to produce the data packets from the selected channel information.

17. (Original) The circuit of claim 16 wherein the decimator filter is a low pass filter having a cut-off frequency approximately equal to twice a frequency half width of a channel.

18. (Original) The circuit of claim 17 wherein the digital filter is a Nyquist filter having a cut-off frequency approximately equal to the frequency half width of the channel.

19. (Previously Presented) The circuit of claim 10 further comprising a metal plate attached to a rear surface of the single monolithic substrate.

20. (Original) The circuit of claim 10 wherein the integrated circuit is a component within a satellite digital television signal receiver.

21. (Currently Amended) An integrated circuit, comprising:
- a single monolithic substrate in which the following circuit components are provided:
- an input receiving an RF analog signal including a plurality of channels;
- a first analog-to-digital converter to sample and convert the RF analog signal to a first digital signal;
- a second analog-to-digital converter to sample and convert the RF analog signal to a second digital signal;
- a first digital tuner that downconverts a received digital signal to a first downconverted digital signal, wherein information of a selected first channel in the downconverted digital signal is centered at zero frequency;
- a first channel decoding digital circuit module connected to the first digital tuner that decodes the first downconverted digital signal to output a stream of data packets for the selected first channel;
- a second digital tuner that downconverts a received digital signal to a second downconverted digital signal, wherein information of a selected second channel in the downconverted digital signal is centered at zero frequency;
- a second channel decoding digital circuit module connected to the second digital tuner that decodes the second downconverted digital signal to output a stream of data packets for the selected second channel; and
- a switching circuit that selectively couples the first and second digital signals output from the first and second converters to the first and second digital tuners;
- wherein ~~circuitry of~~ the converters, tuners, channel decoding digital circuits modules and switching circuit are fabricated on that single monolithic substrate.

22. (Currently Amended) The circuit of claim 21 wherein the first analog-to-digital converter is associated with RF analog signals in a first passband and wherein the second analog-to-digital converter is associated with RF analog signals in a second passband.

23. (Original) The circuit of claim 22 wherein, if the first and second channels are located in the first passband, the switching circuit selectively couples the first and second digital tuners to the first analog-to-digital converter.

24. (Original) The circuit of claim 22 wherein, if the first and second channels are located in the second passband, the switching circuit selectively couples the first and second digital tuners to the second analog-to-digital converter.

25. (Original) The circuit of claim 22 wherein, if the first channel is located in the first passband and the second channel is located in the second passband, the switching circuit selectively couples the first digital tuner to the first analog-to-digital converter and the second digital tuner to the second analog-to-digital converter.

26. (Original) The circuit of claim 22 wherein, if the first channel is located in the second passband and the second channel is located in the first passband, the switching circuit selectively couples the first digital tuner to the second analog-to-digital converter and the second digital tuner to the first analog-to-digital converter.

27. (Currently Amended) The circuit of claim 22 further including:

a first filter tuned to the first passband that outputs the RF analog signal to the first analog-to-digital converter; and

a second filter tuned to the second passband that outputs the RF analog signal to the second analog-to-digital converter.

28. (Currently Amended) The circuit of claim 21 wherein the first and second digital tuners perform ~~are each of a direct sampling type which performs~~ frequency transposition and channel selection in a digital domain.

29. (Currently Amended) The circuit of claim 21 wherein each analog-to-digital converter oversamples the received RF analog signal.

30. (Currently Amended) The circuit of claim 21 wherein the RF analog signal conveys information for the plurality of channels by digital modulation.

31. (Currently Amended) The circuit of claim 21 wherein the channels of the RF analog signal applied to each analog-to-digital converter extend over a given frequency span and wherein each analog-to-digital converter oversamples the received RF analog signal at a sampling frequency at least twice the given frequency span.

32. (Currently Amended) The circuit of claim 31 wherein the RF analog signal comprises a satellite digital television analog signal.

33. (Currently Amended) The circuit of claim 21 wherein each of the decoding digital circuits modules comprises:

a decimator filter that filters the downconverted digital signal to output digital signals relating to the selected channel and adjacent channel information;

a digital filter that filters out the adjacent channel information; and

an error correction stage to produce the data packets from the selected channel information.

34. (Original) The circuit of claim 33 wherein the decimator filter is a low pass filter having a cut-off frequency approximately equal to twice a frequency half width of a channel.

35. (Original) The circuit of claim 34 wherein the digital filter is a Nyquist filter having a cut-off frequency approximately equal to the frequency half width of the channel.

36. (Previously Presented) The circuit of claim 21 further comprising a metal plate attached to a rear surface of the single monolithic substrate.

37. (Original) The circuit of claim 21 wherein the integrated circuit is a component within a satellite digital television signal receiver.

38. (Currently Amended) An electronic device, comprising:
an integrated circuit embodied on a single monolithic substrate and incorporating:
 a multi-channel direct sampling type tuner circuit that receives an RF analog signal composed of several channels and outputs first and second channel digital signals;
 a first channel decoder circuit that receives the first channel digital signal and outputs a first channel stream of data packets; and
 a second channel decoder circuit that receives the second channel digital signal and outputs a second channel stream of data packets;
 wherein ~~circuitry of both~~ the tuner circuit and the first and second channel decoder circuits ~~decoders~~ are fabricated on that single monolithic substrate.

39. (Currently Amended) The device of claim 38 wherein the multi-channel direct sampling type tuner circuit comprises:

 at least one analog-to-digital converter to convert the received RF analog signal to a digital signal;
 a first digital domain frequency transposition circuit that downconverts the digital signal to the first channel digital signal; and
 a second digital domain frequency transposition circuit that downconverts the digital signal to the second channel digital signal.

40. (Currently Amended) The device of claim 39 wherein the multi-channel direct sampling type tuner circuit comprises a first and second analog-to-digital converter that convert the received RF analog signal to a first and second digital signal, and a switching circuit that selectively couples the first and second digital signals to the first and second digital domain frequency transposition circuits.

41. (Currently Amended) The circuit of claim 40 wherein the first analog-to-digital converter is associated with RF analog signals in a first passband and wherein the second analog-to-digital converter is associated with RF analog signals in a second passband.

42. (Currently Amended) The circuit of claim 41 wherein, if the first and second channels are located in the first passband, the switching circuit selectively couples the first and second digital domain frequency transposition circuits to the first analog-to-digital converter.

43. (Currently Amended) The circuit of claim 41 wherein, if the first and second channels are located in the second passband, the switching circuit selectively couples the first and second digital domain frequency transposition circuits to the second analog-to-digital converter.

44. (Currently Amended) The circuit of claim 41 wherein, if the first channel is located in the first passband and the second channel is located in the second passband, the switching circuit selectively couples the first digital domain frequency transposition circuit to the first analog-to-digital converter and the second digital domain frequency transposition circuit to the second analog-to-digital converter.

45. (Currently Amended) The circuit of claim 41 wherein, if the first channel is located in the second passband and the second channel is located in the first passband, the switching circuit selectively couples the first digital domain frequency transposition circuit to the second analog-to-digital converter and the second digital domain frequency transposition circuit to the first analog-to-digital converter.

46. (Currently Amended) The circuit of claim 41 further including:

a first filter tuned to the first passband that outputs the RF analog signal to the first analog-to-digital converter; and

a second filter tuned to the second passband that outputs the RF analog signal to the second analog-to-digital converter.

47. (Currently Amended) The circuit of claim 38 wherein the analog-to-digital converter oversamples the received RF analog signal.

48. (Currently Amended) The circuit of claim 38 wherein the RF analog signal conveys information for the plurality of channels by digital modulation.

49. (Currently Amended) The circuit of claim 38 wherein the channels of the RF analog signal extend over a frequency span and wherein the analog-to-digital converter oversamples the received RF analog signal at a sampling frequency at least twice the frequency span.

50. (Currently Amended) The circuit of claim 49 wherein the RF analog signal comprises a satellite digital television analog signal.

51. (Currently Amended) The circuit of claim 38 wherein each of the channel decoder circuits comprises:

a decimator filter that filters the downconverted digital signal to output digital signals relating to the selected channel and adjacent channel information;

a digital filter that filters out the adjacent channel information; and

an error correction stage to produce the data packets from the selected channel information.

52. (Original) The circuit of claim 51 wherein the decimator filter is a low pass filter having a cut-off frequency approximately equal to twice a frequency half width of a channel.

53. (Original) The circuit of claim 52 wherein the digital filter is a Nyquist filter having a cut-off frequency approximately equal to the frequency half width of the channel.

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54. (Previously Presented) The circuit of claim 38 further comprising a metal plate attached to a rear surface of the single monolithic substrate.

55. (Original) The circuit of claim 38 wherein the integrated circuit is a component within a satellite digital television signal receiver.